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Regulating Positive Emotions: Implications for Promoting Well-Being in Individuals with
Depression

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Abstract

Experiencing positive emotions is paramount to deriving vitality from daily lived experiences. Positive emotions are associated with a range of beneficial outcomes including longevity, reduced incidents of stroke, improved sleep quality, larger social networks, increased prosocial behavior, lower cortisol levels, and increased endogenous opioids and oxytocin. Despite these benefits, only limited research has focused on understanding positive emotion regulation within the context of depression. Rather, mechanisms related to the regulation of negative emotion have been the focus of research and evidence-based treatments. This interdisciplinary review paper aims to advance knowledge regarding the role of positive emotion regulation in individuals with depression in order to inform the development of transdiagnostic evidenced-based approaches to treatment that bolster the experience of positive life events. We draw on research findings across the fields of clinical psychology, affective science, and social psychology in order to identify future directions for novel interdisciplinary translational research regarding mechanisms associated with positive emotion regulation.

Key Words: Positive Emotion Regulation; Well-Being; Depression; Intervention

Regulating Positive Emotions: Implications for Promoting Well-Being in Individuals with Depression

The experience of positive emotion, or a positively-valenced feeling, brief state, or mood (du Pont, Welker, Gilbert, & Gruber, 2016), is associated with a number of favorable health and psychological outcomes. Positive emotions contribute to initiating and maintaining affiliative interpersonal relations and social support (Pressman et al., 2018) which are associated with oxytocin, a hormone neuropeptide implicated in affiliative behaviors and processing positive socioemotional cues and stimuli (Marsh, Yu, Pine, & Blair, 2010). Positive emotions are also related to improved sleep quality, increased exercise, and lower levels of cortisol (Pressman et al., 2018), as well as decreased levels of depression (Bryant, 2003) and pain resilience (Thong, Tan, & Jensen, 2017). Collectively, these factors have a positive impact on a range of health outcomes, including decreased mortality, decreased disease severity, and improved cardiovascular functioning (Pressman et al., 2018). Notably, many of the aforementioned negative health outcomes are observed in individuals with depression (Slavich & Irwin, 2014), and experiencing positive emotions may help prevent and mitigate depression symptoms (Carl, Soskin, Kerns, & Barlow, 2013). Cultivating the capacity to experience positive emotions via upregulating the experience associated with positive stimuli and moments as they occur is critical to psychological and physical health outcomes.

Positive emotion regulation refers to the modulation of the response to stimuli such that the momentary experience of positive emotions is enhanced (Bryant & Veroff, 2007). Affective response to positive stimuli can be intentionally or automatically downregulated (dampened) or upregulated (amplified) to modulate the level of intensity or arousal evoked by an experience or stimulus. Although positive emotion regulation can involve manipulating the response to

negative stimuli (du Pont, Welker, Gilbert, & Gruber, 2016), this paper primarily focuses on identifying psychological mechanisms and processes associated with upregulation of the response to positive stimuli and events in order to reduce depression symptoms and cultivate the healthy experience of positive emotions across the lifespan. The field of clinical psychology has largely overlooked the role of positive emotion regulation impairments in depression, despite a clear beneficial relationship between positive emotions and well-being outcomes. Identifying modifiable psychological mechanisms associated with positive emotion regulation is critical to advancing evidence-based therapeutic approaches that promote societal health and well-being, particularly in the present milieu of rapidly increasing rates of depression and anxiety disorders (World Health Organization, 2017).

Positive Emotion Regulation Disruptions in Depression

Anhedonia (i.e., lack of pleasure) is a hallmark feature of Major Depressive Disorder (MDD; American Psychiatric Association, 2013), and may be associated with impairments in positive emotion regulation (Joorman & Stanton, 2016). Anhedonia negatively impacts daily function, predicts poor treatment response, indicates risk for future depressive episodes, and shows specificity with regard to depression diagnosis (Khazanov, Ruscio, & Swendsen, 2019; Watson & Naragon-Gainey, 2010). Treatment outcomes for depression show that 54% of individuals relapse within two years following cognitive-behavioral therapy (Vittengl, Clark, Dunn, & Jarrett, 2007). Thus, identifying constituent psychological correlates of anhedonia may be paramount to advancing effective evidenced-based therapies for depression. Impaired capability to regulate negative emotions is considered a robust feature of depression, and previous emotion regulation research has predominantly focused on downregulating negative emotions to decrease sadness and negative affect (Joorman & Stanton, 2016). Moving forward, a

new focus on developing evidence-based strategies to target impairments in positive emotion regulation in depression may be critical to improving the low treatment outcome rate in depression.

Anhedonia may involve related bi-directional reactivity and regulatory affective processes including 1) positive attenuation, or hyporeactivity to positive stimuli (Blysm, Morris, & Rottenberg, 2008; Forbes & Dahl, 2005), and 2) impaired capability to enhance or upregulate affective responses evoked by positive stimuli (Forbes & Dahl, 2005). Broadly defined, emotion regulation refers to the psychological processes that modulate an initial emotional response (Lewis, Zinbarg, & Durbin, 2010) and implies that a change has occurred from initial reactivity (e.g., baseline affective response to a stimulus); however, identifying a clear dividing line between reactivity and regulation is complex (Joorman & Staton, 2016). Further, from the perspective of affective chronometry, it is challenging to delineate when reactivity ends and emotion regulation begins (Davidson, 2018). For example, response to affective stimuli is observed as early as 100 milliseconds in electroencephalography (EEG) research, and these early responses are influenced by modifiable individual differences such as empathy (Stockdale et al., 2017) that may serve as interpersonal emotion regulatory mechanisms (Zaki & Williams, 2013).

In laboratory settings, findings regarding emotional reactivity to positive stimuli in individuals with current and/or remitted depression have been mixed, with some studies reporting blunted response to positive stimuli in individuals with depression (Blysm, Morris, & Rottenberg, 2008; Joorman & Staton, 2016), and other studies indicating no differences in response to positive stimuli (Treadway and Zald, 2011). Given the mixed findings in this literature, a range of individual differences are likely contributing to these findings. Additional research is needed to clarify the role of reactivity to positive stimuli in depression since baseline

affective reactivity may impact subsequent selection and implementation of emotion regulation strategies (Lewis, Zinbarg, & Durbin, 2010). Further, there are inconsistencies in experimental tasks and measurement metrics used across studies, including various methods used for assessing depression (e.g., dimensional versus categorical approaches) which could be contributing to the range of findings regarding reactivity observed across studies.

Depression research within the clinical science landscape has generally focused on characterizing differences in reactivity to affective stimuli and has largely overlooked the role of positive emotion regulation (Joorman & Staton, 2016). However, emerging research on positive emotion dysregulation in depression indicates that impaired regulatory mechanisms may diminish the frequency, duration, intensity, and quality of positive emotions, including difficulties anticipating, initiating, sustaining, or upregulating positive stimuli and experiences (Forbes & Dahl, 2005; Joorman & Staton, 2016; Liu & Thompson, 2017). Of note, suppression and dampening of positive emotion are also associated with exacerbated depressive symptoms (Joorman & Staton, 2016; Liu & Thompson, 2017; McMakin, Siegle, & Shirk, 2011; Smith & Hanni, 2019). Selecting and implementing effective emotion regulation strategies that are adaptive for a given context involves deploying cognitive control functions to exert control over emotion response during regulation (Joorman & Staton, 2016). Cognitive control functions and associated brain networks are impaired in individuals with depression (Levin et al., 2007; Siltan et al., 2011), and individuals with depression select and use ineffective emotion regulation strategies, unless adequate scaffolding is provided (Joorman & Staton, 2016). Increasing the capacity to experience positive emotions in individuals with depression will likely involve multiple-pronged intervention approaches that not only harness positive emotion regulation

strategies but also improve cognitive control functions that are fundamental to effectively implementing and sustaining positive emotion regulation strategies (Joorman & Staton, 2016).

Interventions and Strategies to Increase Regulatory Capacity for Experiencing Positive Emotions

Savoring-based regulatory strategies are the most commonly used strategies implemented to sustain and upregulate positive emotions (Heiy & Cheavens, 2014; Liu & Thompson, 2017). First coined by Bryant (1989), savoring refers to the capacity “to attend to, appreciate, and enhance the positive experience in one’s life” (Bryant & Veroff, 2007, p. xi). People initiate savoring responses in reaction to a positive event or feeling as a way to maintain, intensify, or prolong the initial positive experience (Bryant & Veroff, 2007). Savoring involves polyregulation (e.g., duPont et al., 2016; Ford, Gross, & Gruber, in press) and can involve activating a variety of cognitive and behavioral emotion regulation strategies (e.g., amplification or positive rumination) that increase frequency, intensity, and duration of positive feelings (Bryant & Veroff, 2007). Indeed, Bryant and Veroff (2007) identified ten types of behavioral, cognitive, and interpersonal savoring strategies: sharing with others, memory building, self-congratulations, sensory-perceptual sharpening, comparing, absorption, behavioral expression, temporal awareness, counting blessings, and avoidance of kill-joy thinking. While savoring, one may eagerly anticipate *future* positive experiences, focus on ongoing positive experiences as they occur in the *present* moment, or reminisce about *past* positive experiences. Regardless of the temporal focus, savoring processes upregulate positive emotions in the present moment.

Savoring strategies that amplify positive emotions are associated with greater frequency of positive affect (Smith, Harrison, Kurtz, & Bryant, 2014), and the capacity to savor is positively associated with extraversion, self-esteem, happiness, and life satisfaction (Bryant,

2003). Correspondingly, lack of savoring capacity is inversely correlated with anhedonia, depression, hopelessness, and neuroticism (Bryant, 2003), indicating that the capability to upregulate positive emotions likely involves modifiable processes that are vulnerable to change in depression. With regard to temporal domains of positive emotion upregulation, difficulty savoring positive stimuli and moments as they occur in the present moment may predict depression symptoms more so than difficulties anticipating or reminiscing about positive events (Carver & Johnson, 2009). Joorman and Stanton (2016) theorized that dampening positive emotions along with difficulties savoring contribute to anhedonia in depression.

Positive-psychology based approaches have been implemented to enhance past-, present-, and future-oriented temporal domains of positive emotion regulation (i.e., Smith et al., 2014) in efforts to boost happiness and life satisfaction. Many of these approaches evaluate specific positive emotion regulation strategies. For example, cultivating the ability to imagine future positive events can enhance anticipating, taking mindful photographs aids in momentary savoring, and increasing awareness of recent positive events serves to bolster reminiscing (Smith et al., 2014). Although the field of positive psychology has developed a range of strategies to enhance positive emotions in non-clinical populations (Quoidbach, Mikolajczak, & Gross, 2015), additional research is necessary to incorporate these strategies into evidenced-based treatments for individuals with depression. Minimal research has studied neurophysiological correlates of these strategies, and this remains a key area to develop in order to inform translational approaches to psychological disorders.

With specific relevance to depression, studies aimed at enhancing savoring capacity show that enriching any of the three temporal domains of savoring (reminiscing, savoring the moment, or anticipating) is associated with increased frequency and intensity of positive affect, and

decreased negative affect (Bryant, 2003; Bryant & Veroff, 2007). Training on momentary positive emotion regulation (i.e., memory building, expressing positive emotions) resulted in decreased self-reported depression symptoms and negative affect (but not positive affect) when compared to a control group after two weeks (Hurley & Kwon, 2012). Savoring may improve the capability to recognize and enjoy positive moments, even during difficult times, and as such contribute to decreasing the effects of negative emotions (Smith & Hanni, 2019). A savoring intervention study conducted in older adults showed that diminished dampening of positive emotions was related to decreased depression symptoms (Smith & Hanni, 2019). Positive self-attributions for recent positive events have been associated with attenuated depression symptoms and enhanced positive affect following positive events in a sample of college-aged women with dysphoria (McMakin, Siegle, & Shirk, 2011). Indeed, increased attention to positive stimuli is a candidate psychological mechanism through which positive emotion regulation strategies are theorized to mitigate depression symptoms (Carl, Soskin, Kerns, & Barlow, 2013; Joorman & Staton, 2016).

The initial research investigating the efficaciousness of savoring strategies in individuals with depression symptoms is promising, but more work is needed to identify effective levels of dose-response effects and to clarify which specific positive emotion regulation processes (e.g., increased amplification and/or reduced dampening) and strategies robustly reduce anhedonia and depression symptoms. In order to better inform evidence-based practices for treating depression, future research in this area should be conducted in study samples that are specifically recruited based on high levels of depression symptoms. With the exception of the study conducted by McMakin, Siegle, and Shirk (2011), previous savoring intervention research reporting depression

outcomes has relied on non-selected samples (e.g., Hurley & Kwon, 2012; Smith & Hanna, 2019).

Although savoring and mindfulness are not analogous (Bryant & Veroff, 2007; Bryant & Smith, 2015; Hurley & Kwon, 2012), the importance of cultivating non-judgmental attention and awareness in the present moment is corroborated by research on mindfulness meditation practices and mindfulness-based interventions (Gu, Strauss, Bond, & Cavanagh, 2015). Mindfulness meditation is theorized to enhance the capacity for and experience of positive emotions (Garland, Farb, Goldin, & Fredrickson, 2015; Wielgosz, Goldberg, Kral, Dunne, & Davidson, 2019), and ultimately promote well-being (Dahl et al., 2015). Despite the burgeoning neuroscience research on mindfulness and positive emotion, few theoretical models exist that map the processes via which mindfulness specifically enhances the experience and regulation of positive emotions. Garland, Farb, Goldin, and Fredrickson (2015) proposed that mindfulness broadens cognitive scope which in turn bolsters the capacity for savoring. Wielgosz, Goldberg, Kral, Dunne, and Davidson (2019) theorized that mindfulness meditation practices modify positive valence systems through enhanced emotion awareness, modulations in emotional reactivity, increased use of cognitive reappraisal, and alterations in reward processes. Along with increasing attention and awareness toward positive experiences as they occur, positive reappraisal may be a key emotion regulation mechanism related to mindfulness meditation practice that reduces stress and depression symptoms (Garland, Farb, Goldin, & Fredrickson, 2015).

Finally, insights into strategies that enhance positive emotion regulation may be gained from developmental lifespan research showing that psychological well-being and the increased capacity for upregulation of positive emotion tends to improve with age, which may be due to

corresponding enhanced emotion regulation capability (Urry & Gross, 2010). The socioemotional selectivity theory posits that older adults tend to prioritize socioemotional goals due to a greater awareness of limits to their life span (Charles & Carstensen, 2010). Accordingly, older adults may regulate emotions through greater selectivity of activities (e.g., avoiding stressful situations) and of cognitive resources (e.g., preference for positive information; Sims, Hogan, & Carstensen, 2015). However, age-related advantages in emotion regulation may be reduced or eliminated in situations that limit selectivity and elicit high levels of emotional arousal (Charles, 2010). Smith and Hanni (2019) administered a brief one-week savoring intervention to adults between the ages of 60 and 93, and participants who completed at least six days of the intervention reported decreases in depression symptoms and increased happiness, primarily via decreased dampening of reactions to positive emotions. The capability for positive emotion regulation appears to be dynamic and influenced by individual differences, and the implementation of positive emotion regulation strategies by older adults may provide initial insight into modulation of psychological mechanisms associated with bolstering positive emotion regulation capacity across the lifespan.

Ultimately, it is likely that the cumulative effects of regulating positive emotions in a healthy manner mitigates depression symptoms and facilitates well-being and life satisfaction. The capacity for positive emotion regulation reflects dynamic processes that appear to be modifiable across the lifespan via specific strategies and interventions tailored to enhance the experience of positive emotions. Further research is needed to identify the extent to which interventions and strategies that aim to modulate positive emotion regulation specifically target positive valence systems, or whether negative valence systems also change in response to intervention, as suggested by some of the findings reviewed above. Identifying key

neurophysiological mechanisms that are associated with positive emotions and positive emotion regulation strategies remains an important agenda for future research, particularly with the aim of promoting resilience to depression and ameliorating debilitating psychopathology symptoms across the lifespan.

Recommendations for Additional Reading

du Pont, A., Welker, K., Gilbert, K. E., & Gruber, J. (2016). The emerging field of positive emotion dysregulation. *Handbook of Self-Regulation: Research, Theory and Applications*. 3rd. New York: Guilford, 364-379.

This seminal chapter offers a framework for studying psychological mechanisms that contribute to positive emotion dysregulation and provides recommendations for future research that will enhance interventions that promote adaptive regulation of positive emotions.

Hurley, D. B., & Kwon, P. (2012). Results of a study to increase savoring the moment: Differential impact on positive and negative outcomes. *Journal of Happiness Studies*, 13(4), 579–588. <http://dx.doi.org/10.1007/s10902-011-9280-8>

This study illustrated that a two-week group intervention designed to harness savoring the moment decreased self-reported depression symptoms and negative affect in non-selected college students; however, differences in positive affect were not reported.

Joormann, J., & Stanton, C. H. (2016). Examining emotion regulation in depression: A review and future directions. *Behaviour Research and Therapy*, 86, 35-49. <https://doi.org/10.1016/j.brat.2016.07.007>

This broadly scoped review paper provides a useful overview of the large body of research regarding emotion regulation in depression, which has generally focused on dysregulation of negative affect. The review paper highlights the limited research on positive emotion regulation in depression and also explores the influence of impaired cognitive control functions on emotion regulation capabilities in individuals with depression.

Pressman, S. D., Jenkins, B. N., & Moskowitz, J. T. (2018). Positive affect and health: What do we know and where next should we go? *Annual Review of Psychology*. <https://doi.org/10.1146/annurev-psych-010418-102955>

This review highlights the critical relations between positive affect and health. The paper provides a critical discussion of measurement and design issues and provides insight into potential physiological, social and behavioral pathways in order to advance future research in this domain which has implications for policy and societal well-being.

Smith, J. L., & Hanni, A. A. (2019). Effects of a savoring intervention on resilience and well-being of older adults. *Journal of Applied Gerontology*, 38(1), 137-152. <https://doi.org/10.1177/0733464817693375>

A brief one-week savoring intervention was administered to adults between the ages of 60 and 93. Participants who adhered to the intervention for at least six days reported reductions in depression symptoms and increased levels of happiness. This is the first study to report the effects of a savoring intervention in older adults.

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